

THE CARRIER

Volume XLVIII Number 4

www.mdarc.org

April 2000

MDARC

April Meeting Friday April 21 7:30 PM

Program

Stanford Satellite Presentation

The speakers will be:

Professor Bob Twiggs KEQMD
Dave Joseph WA6BOY
Greg Hutchen KF6YCR
Dick Kors KM6EP

Our Savior's Lutheran Church
1035 Carol Lane
Lafayette CA

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The Thrill of Radio Communication Events

Pete Harris, KE6ZIW, odyssey@ccnet.com

Participating in radio communications for public service events is a thrilling experience for many different reasons. Some of these are:

- §1 The magic of radio transmissions,
- §2 The camaraderie of being on a radio team,
- §3 The chance to do something meaningful for a good cause,
- §4 The fun and satisfaction of using your radio equipment and opportunity to learn its various capabilities in real-life situations,
- §5 The beautiful places and settings that you get to enjoy

The events listed below are coming up in the near future and still have some slots available. For most events all you need is a hand-held 2 meter radio and an extra battery. Give me a call or email to sign up (925-228-4503, odyssey@ccnet.com). Let me know about any other individual events you want to coordinate. If you want more information about a particular event, call me or the event coordinator. If you are new to this and want to break in gently, we can team you up with another ham.

March of Dimes Walk America

4/29/00, Heather Farms Park, Walnut Creek
Event Coordinator: Aaron Matzkin, 925-820-5848

Concord Mt. Diablo Trailride

5/6/00, Mt. Diablo— 4WD vehicles welcome
Event Coordinator: Joe Gregory, 925-930-6889

Devil Mountain Run, 5K & 10K

5/7/00, Danville (for Children's Hospital)
Event Coordinator: Ed Ritchie, 925-837-3265

International Arabian Horse Assoc Trailride #2

5/13/00, Sunol Regional Park to Mt. Rose
4WD vehicles welcome
Event Coordinator: Joe Gregory, 925-930-6889

Human Race

5/13/00, Lafayette Reservoir

Event Coordinator: Lauren Styles, 925-676-2186

4th of July Parade (morning)

7/4/00, Pleasant Hill

Event Coordinator: Bob Williams, 925-934-1873

4th of July Fireworks Celebration (evening)

7/4/00, San Ramon

Event Coordinator: Ed Ritchie, 925-837-3265

Sign up! You'll have a great time and be giving something valuable back to your community.

73's Pete

SB 1714 - Antenna Bill - Assignment

Harry Styron, K6HS,

Volunteer Counsel Coordinator

SB 1714 has been assigned to the Local Government Committee of the California Senate for hearings. The chair of the Local Government Committee is Senator Richard K. Rainey, of Contra Costa County. Senator Rainey is the former County Sheriff, and was responsible for establishing the Sheriff's Amateur Radio Reserve. He ought to be sympathetic, particularly if the emphasis is put on resources and training for emergency and public service. Where it exists I would make a point of cooperation with other services, such as REACT, and specific participation in emergency service situations. MARS participants should point out the emergency support role of that service and the fact that it relies extensively on HF frequencies assigned by the military for that purpose. Senator Rainey will understand without being told what RACES is. Senator Rainey should be addressed as follows:
Honorable Richard K. Rainey, Chair Local Government Committee State Capitol, Room 410 Sacramento, CA 95914
Dear Senator Rainey: Senator Rainey's email address is senator.rainey@sen.ca.gov Please make an effort to write to Senator Rainey as chair, noting any local ordinances in your City or County which stop you from getting a permit for an

antenna or make it more expensive, how that antenna would be valuable for emergency services, and the fact that antennas regulations, high permit fees and the like hurt all of the amateur service as a disincentive to activity. Please spread the word as widely as possible.

73, Harry

April Stanford Satellite Presentation

Terry Matzkin, KE6WRE

Professor Robert Twiggs, Director of the Stanford Satellite Systems Development Laboratory and others associated with the lab will present an overview of the satellite activities at Stanford University. The team will discuss SAPPHIRE, OPAL—the first totally student built successfully launched satellite, plus an overview of the other 14 currently active satellite projects in the lab. featured in the presentation will be short videos, slides and several examples of “daughter” satellites: called picosats, CubeSats and CanSats (a complete satellite contained in a soda can). The team will also bring the prototype of “StanSat”, an amateur radio cross-band VHF repeater about the size of a paperback and weighing less than 2kg. This satellite was launched from OPAL in January and is presently in orbit, although not responding at this time. Most importantly, a challenge will be issued by the Stanford team to the club to become involved in defining, building, and launching a club “cube” satellite of the club's design, on the condition the club involve secondary school students in the project.

Web Sites of Interest

Opal home page

<http://ssdl.stanford.edu/opal/>

Stanford Satellites home

<http://aa.stanford.edu/~ssdl/>

Emerald home page

<http://ssdl.stanford.edu/Emerald/home.html>

Sapphire home page
http://aa.stanford.edu/~ssdl/projects/squirt1/sapphire_overview.html

CanSats at Blackrock
<http://ssdl.stanford.edu/arlist/>

Bay Area Rocket Club
<http://www.baynar.org/>

CanSat home page
<http://ssdl.stanford.edu/aa236a/#kiwi>

CanSat Summer project
<http://ssdl.stanford.edu/SummerSat/bad.html>

CanSat Student project
<http://ssdl.stanford.edu/aa236a/CanSat/teams.html>

Santa Clara Univ. Program
<http://www.eetimes.com/story/OEG19991011S0038>

Picosat info

<http://www.spacer.com/spacecast/news/nanosat-99f.html>

yahoo Rocket Info

<http://dir.yahoo.com/Recreation/Hobbies/Rockets/>

Speakers

Professor Bob Twiggs	KEQMD
Dave Joseph	WA6BOY
Greg Hutchen	KF6YCR
Dick Kors	KM6EP

73, Terry

MDARC BOARD MEETING 3/6/00

Jim Brunk reviewed a spread sheet of the capital projects that the Rocky Ridge Committee has planned in 2000 and the associated financials. The Board was pleased with the work and it is hoped that Jim can continue this in the future. They asked Jim to document the Mt. Oso project in future reports.

MDARC Auction May 19, 2000

The club will hold its annual auction May 19. Ham gear and related equipment are welcome. Doors open at 6:00 PM, auction begins 7:00 pm. The location will be 1035 Carol Lane, Lafayette. Dennis Fuller KC6QHH will preside over the auction.

This is a great opportunity to clean out the "shack" or to search for bargains. These events are always a lot of fun. I hope to see you there.

John Schulze, KR6CR
Auction Chair

The programs for the next 3 months are:

March	Expert from the office of emergency services
April	An expert talking on satellite communications
May	Auction

Jay will be asked to announce them on the net.

Ron Luttringer has accepted the appointment as VE Chairman and will also manage the VE activities at PACIFICON 00.

In February Robert Hampton has accepted the appointment as Emergency Coordinator for MDARC.

The MDARC web site needs considerable maintenance. Greg will take care of it.

The MDARC picnic will be July 22. It will cost \$3.00 per person.

The next Board meeting will be April 3.

MDARC BOARD MINUTES 2/7/00

Jim Brunk discussed the work of the repeater committee. He suggested that a list of questions that he provided be used to determine the clubs interest in the repeaters. Jay was asked to get reactions to the questions on his Thursday Net. Ed agreed to revise the questions so that they might be used to help in a possible survey that would be administered by the Board.

Jim reviewed the some of the current active projects but the discussion got bogged down in trying sort out the costs-to-date. The Board felt that there needed to be improved communications from the RRRC as to the project plans, their status and the costs-to-date. Jim agreed to prepare a spread sheet for the Board with up-dated information on all active projects.

No other business was discussed

Dick Brown, KT6X
Acting Secretary

Storage 2000 - Been there. Done that. Fred Moore, Computer Technology Review

As we mark the end of the twentieth century, let's pause to observe and reflect on the birth and growth of the information age and, in particular, the computer data storage industry. If we don't take a moment now, we may never have another chance to catch our breath, as the rate of change our industry is about to go through as the next century begins will quickly eclipse that of the past fifty years. In this article, we will look at some interesting "then" and "now" comparisons, along with some other "factoids" that have marked the astonishing progress of data storage and related fields.

What's in A Square Inch On Magnetic Disk?

* The first disk drive contained 5 MB on a 24 inch diameter platter when it was delivered in 1956, the RMAC 350. Today's largest capacity disk contains 47 GB, or a capacity of 9,400 times greater.

* If the recording density of the RMAC were still used today, it take a disk surface larger than six NBA basketball courts to contain 47 GB, which is the capacity of today's largest 5.24" diameter disk drive.

* The human thumbnail averages about 0.4 square inches in area. The latest laboratory disk a real density advancements have yielded an a real density of 35.3 Gbit per square inch, up from just over 20 Gbit per square inch this time last year. At this density, a magnetic disk surface the size of a human thumbnail could contain 14.12 Gbit or 1.412 GB. This equates to the equivalent of nearly fourteen sets of an average encyclopedias having an average digital size of approximately 100 MB each or roughly 23 dictionaries having an average digital capacity of 60 MB each. An area of disk the size of the child's thumbnail can hold about four dictionaries at today's magnetic densities.

* Each square inch of disk space can hold about three hours and 15 minutes of MPEG-2 compressed video, the equivalent to two full length movies or 77 hours of MP3 compressed video using lossy-compression techniques.

* A square inch of disk space can hold the equivalent of 2,187,500 sheets of double-spaced 8.5 inch by 11 inch type written paper. This would stack nearly 730 feet tall and lying end-to-end, would stretch 380 miles further than the distance from San Francisco to Los Angeles.

How Big Is A Terabyte On Paper?

* 1 TB (1,000 GB) of text on paper would consume approximately 42,500 trees. Assuming twelve characters of text per inch, 1 TB of data in a straight line would circle the earth 56 times stretching a distance of 1.4 million miles. This would equal nearly three round trips from the Earth to the Moon. Most paper is still printed on a single-sided copy.

* It is estimated that printing increases nearly 40% in an office where E-mail has been introduced.

* At least 1.2 trillion sheets of paper are expected to be consumed by laser printer and 1.1 trillion sheets of paper are expected to be used by office copiers worldwide in the year 2001.

* The United States Library of Congress is estimated to require 18 TB of digital storage to hold its contents. This would equate to 765,000 trees to produce enough paper to store its contents.

* A four-drawer file cabinet can hold up to 800 MB of data, based on type size and double-sided printing.

Comparing Tape Technology Then And Now

* The first storage medium for computers was punched card

containing eighty characters of data. In 1952, IBM was producing 16 billion punched cards per year. In 1952, the first magnetic tape drive, the IBM 726, replaced punched cards as the principal storage medium for large data files. Magnetic tape technology has seen a considerable increase of function and capacity, though not on nearly the steady evolutionary path as magnetic disks. Some of the highlights of magnetic tape progress as follows:

* The first tape drives implemented a 7-track recording format on an eight-inch diameter reel and had a linear recording density of 100 bits per inch and had a capacity of 1 MB or the equivalent of 12,500 punched cards.

* Using a native capacity of 100 GB per cartridge today's tape cartridges hold 100,000 times more capacity than the first tape reel.

* Today's latest magnetic tape technologies are targeting 100 GB(uncompress) capacity per cartridge on as many as 384 recording tracks using up to 2,000 feet of thin tape in a single cartage.

* The Ultrium format of LTO (Linear tape Open) tape has specified a native capacity of 800 GB in its fourth generation product roadmap. At a tape compression ration of 3 to 1, this cartridge would contain 2.4 TB of data or the equivalent capacity of two of Storage Tek's original Nearline libraries (1988) when each library (Silo) contained 6,000 cartridges with a capacity of 200 MB each. Thus, the capacity of 12,000 non-compressed tape cartridges in 1988 could fit in one compressed LTO Ultrium fourth generation cartridge in the future, a volumetric efficiency increase of 12,000 times!

Other Selected observations about storage and Information Technology from a variety of publication, Market research data and private sources include:

* Today, over 50% of the world's data are born digital, not on paper, fliche, charts, films or maps, meaning that its first occurrence is in a computer-generated format. Estimates have this number reaching 85% by 2010.

* From the digital data explosion are estimates that 28% of today's data is created and read only once.

* It is faster to move two or more TB of data from New York to San Diego by airplane than on a single Fibre Channel at 100 MB/sec. Fibre Channel is faster for less amounts than 2 TB.

* A yotta byte, the largest defined capacity measurement, is equal to 10 to the 24th (a septillion) power. A terabyte is 10 to 12th power. The largest denomination above one million is the centillion, equal to 10 to the 303rd power.

* All the estimated 81.8 billion minutes (or 56,805,656 days) that were carried across the world's public telephone network in 1997 can now be transmitted over a single high speed optical fiber in approximately eleven days. Private network minutes are not accounted for.

* There are now over 1,000 Internet Service Providers (ISP's) worldwide.

* Ninety-four percent of most visited web sites in the world are in the United States and forty percent are in California.

* The average number of Email messages sent on an average day in the United States was 300 million in 1995 and will be about 3.5 billion this year. Estimates for E-mail traffic are expected to exceed 8 billion by year-end 2002. Fifteen years ago, the Internet had only 1,000 host computers.

* China has about 4 million web users today and expects the number to be 27million by 2001. Mexico has just over 1 million people with web accounts while Japan has 17 million web users.

* Current fuel economy ratings show that it takes about one pound of coal to create, package, store and move 2 MB of data. At 100 million Internet nodes, the electrical consumption would add up to 290 billion-kilowatt hours of demand, equal to about 8 percent of the total demand of the United States. If one billion PC's were attached to the web, they would account for electrical demand, equal to the total capacity of the United States today. (See Forbes magazine, May 1999).

The progress of information technology and the storage industry has been phenomenal since its early beginnings in 1952. With storage capacities now exceeding 60 percent growth rates per year and microprocessors density tracking Moore's law of doubling every eighteen months with no clear end in sight, we can expect these observations to become obsolete quickly.

Save this article for future reference; one day we will wonder what it was like when the Information Age was in its infancy.

Have you seen QSL .NET (www.qst.net)

This site is dedicated to the sole purpose of furthering the abilities and interest of the Amateur Radio Community. If you are a licensed Amateur Radio Operator you are invited to reserve your free space on this server NOW.

Sign Up and you will receive free E-Mail, with

forwarding to your existing service, along with free server space to either move your homepage to this server, mirror your existing one, or lose all those excuses and finally START one.

Full FTP capabilities are granted with a separate FTP area. This is provided for the purpose of furthering this great hobby as we know it.

Now to the hard part, what do you have to do?? That is really the easy part, just move to the left side of the screen and "click" the part that says Sign Up for a FREE Homepage or E_mail Account! It is that easy, go ahead, do it NOW!

Tell your fellow Ham's about this free E-Mail and Homepage server. Spread the word, encourage this site to all Amateur Radio Operators, the more the better.

If you have any questions after surfen' around this site, or you just want to inquire about this server, please feel free to contact via E-Mail. Send me your thoughts and I will do my best to answer all questions.

QSL.NET is funded by K3TKJ and the generous contributions of users. Thanks for the support!

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Membership Update:

Please note the following changes and additions to our roster. Electronic versions of the roster will be e-mailed after April 1. Please send all changes (especially after the restructuring upgrades) to Sam, KO6JR in writing (e-mail OK) at the Club PO box or in person at a meeting. 73, Sam, KO6JR, membership chair

Name, Call, License Class; Spouse Name & Call

* = Rocky Ridge Supporter

Address, Phone numbers, e-mail

Arvidson, Lester, KE6WJQ (T); 1725 Helix Ct, Concord, CA 94518 (h) 925-680-4554	arvidson@jps.net editor omission
Bates, John, N6PUL (T+); Marie KE6DYT 252 Greenwich Dr, Pleasant Hill, CA 94523 (h) 925-295-9802 (w) 925-283-2417 (fax) 925-284-1525	renewal
Brant, Phil(Uncle Phil), WB6VJR (T+); 4627 Alma Ave, Castro Valley, CA 94546 (h) 510-537-3858	unkphil2@juno.com renewal
Bryant, Rufus S., Jr, N6NFR (G); 632 E. 12th St., Pittsburg, CA 94565 (h) 925-473-9530	psalm37@bigplanet.com renewal
Cannon, Byron A., WQNE (G); Dolly P.O. Box 187, Bethel Island, CA 94511 (h) 925-684-9239	call sign change
Clark, Donald, KA6AKH (E); 2904 Hillsdale Dr, Pleasant Hill, CA 94523 (h) 925-947-6627 (w) 925-934-9859	don_clark@eiz.com new member
Colber, Valerie, KE6DYR (T); P.O. Box 6097, Rheem Valley, CA 94570 (h) 925-254-0868 (fax) 925-254-0808	vcolver@ccnet.com new member
Dickey, Marriott, N6RFQ (E); Elizabeth 113 Hillcrest Dr, Orinda, CA 94563 (h) 925-254-0486	marriott9@juno.com correction
Driscoll, Reginald F.(Reggie), WA6ZAP (T+); Linda 1224 Saint Elizabeth Ct, Concord, CA 94518 (h) 925-825-1252	rfdiscoll@worldnet.att.net new member
Gracer, Richard, KJ6RO (A); Sonia 256 Belaire Ct, Danville, CA 94526 (h) 925-735-1663 (w) 925-277-1100 (fax) 925-277-1358	richard@gracermd.com new member
Kinsey, Bill, KF6HAY (T); Julie KF6MKD 1461 Lydia Ln, Clayton, CA 94517 (h) 925-672-2532	new member
Pascale, J.J., W6JJP (T+); 1535 W Cypress Rd, Oakley, CA 94561 (h) 925-625-9356	address change
Pascale, John, N6QNS (A); Ann 1535 W Cypress Rd, Oakley, CA 94561 (h) 925-625-9356 (w) 925-680-4364 (fax) 925-680-4416	n6qns@arri.net address change
Smith, J.C., K0HPS (E); Linda KE6SMZ 1249 Dewing Ln., Walnut Creek, CA 94595 (h) 925-944-1420 (w) 925-947-0540 (fax) 925-947-0540	k0hps@amsat.org correction
Thews, Al, N6PZG (T+); Carol 286 Santa Clara Ave, Oakland, CA 94610 (w) 510-428-9152 (fax) 510-428-9146	new member

CALENDAR OF EVENTS

04/15/2000 8:00 AM PACIFICON General Meeting	Emil Villas in Concord
04/21/2000 7:30PM MDARC	General Meeting
04/28/2000 Deadline for May Carrier	
05/01/2000 7:30PM MDARC Board Meeting	Emil Villas in Concord
05/19/2000 7:30PM MDARC General Meeting	
05/20/2000 8:00 AM PACIFICON General Meeting	Emil Villas in Concord
05/26/2000 Deadline for June Carrier	

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